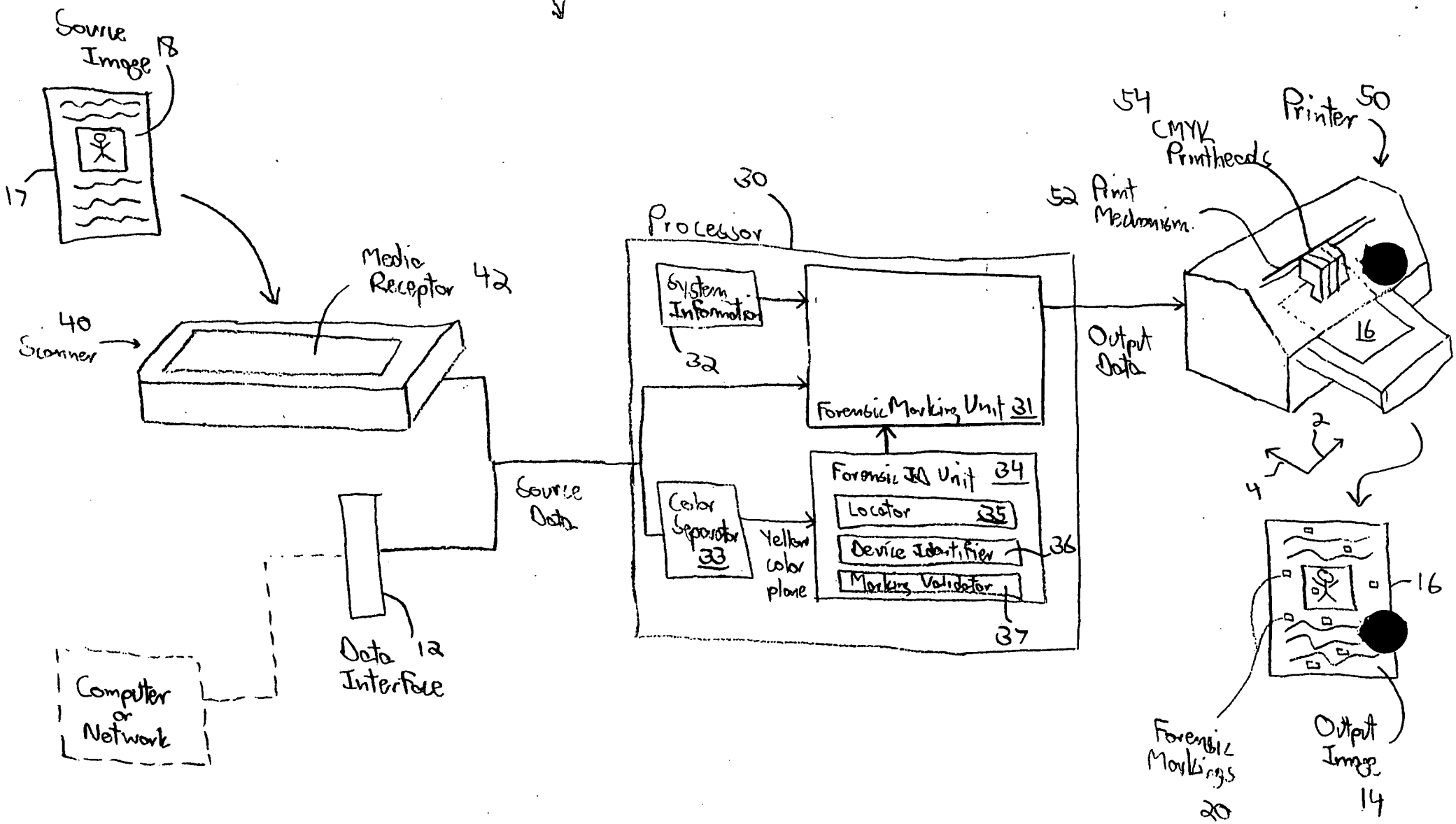

10
Source Image 18
17
Media Receptor 42
40 Scanner
Source Data
Data Interface 12
Computer or Network
30 Processor
System Information
32
Color Separator 33
Yellow color plane
Forensic ID Unit 34
Locator 35
Device Identifier 36
Marking Validator
37
Forensic Marking Unit 31
Output Data
54 CMYK Printheads
52 Print Mechanism
Printer 50
16
2
4
16
Forensic Markings 20
Output Image 14

FIG. 1

5/10

Source Image 18

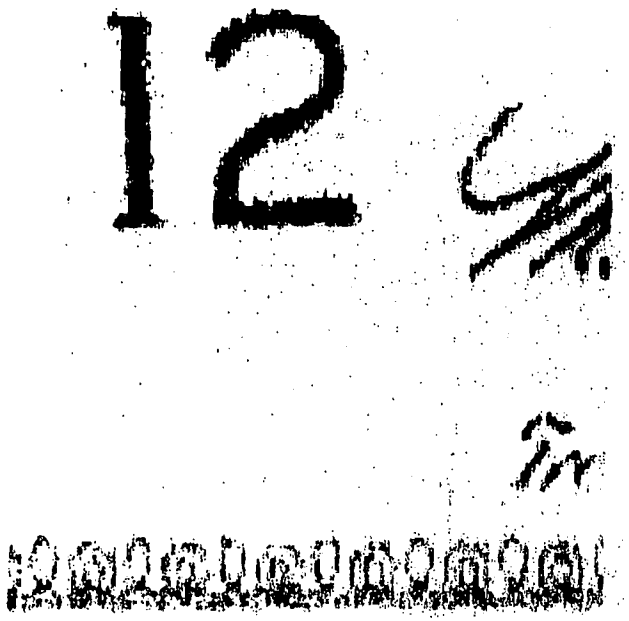


FIG. 2A

Output Image 14

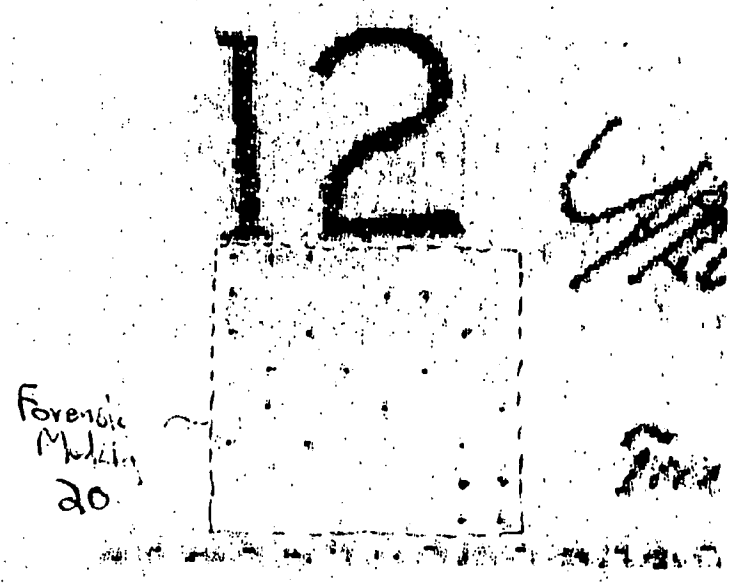
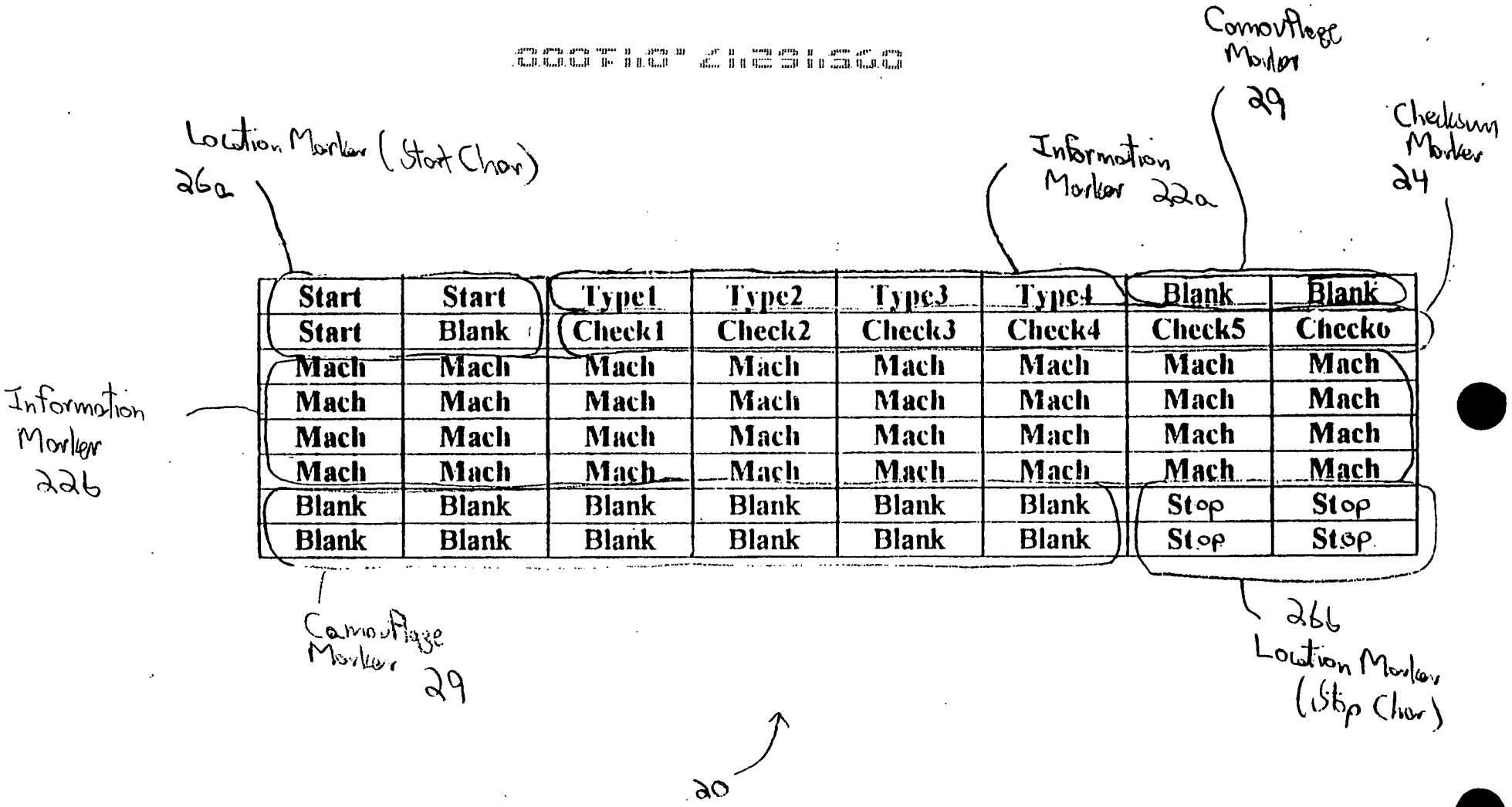


FIG. 2B



Start	Start	Type1	Type2	Type3	Type4	Blank	Blank
Start	Blank	Check1	Check2	Check3	Check4	Check5	Check6
Mach	Mach	Mach	Mach	Mach	Mach	Mach	Mach
Mach	Mach	Mach	Mach	Mach	Mach	Mach	Mach
Mach	Mach	Mach	Mach	Mach	Mach	Mach	Mach
Mach	Mach	Mach	Mach	Mach	Mach	Mach	Mach
Blank	Blank	Blank	Blank	Blank	Blank	Stop	Stop
Blank	Blank	Blank	Blank	Blank	Blank	Stop	Stop

Definitions:
Start/Stop = Common repeated patterns in each matrix
Type*X* = Machine type identifier
Check*X* = Checksum bits
Mach = Machine serial number encoding cells

FIG. 3

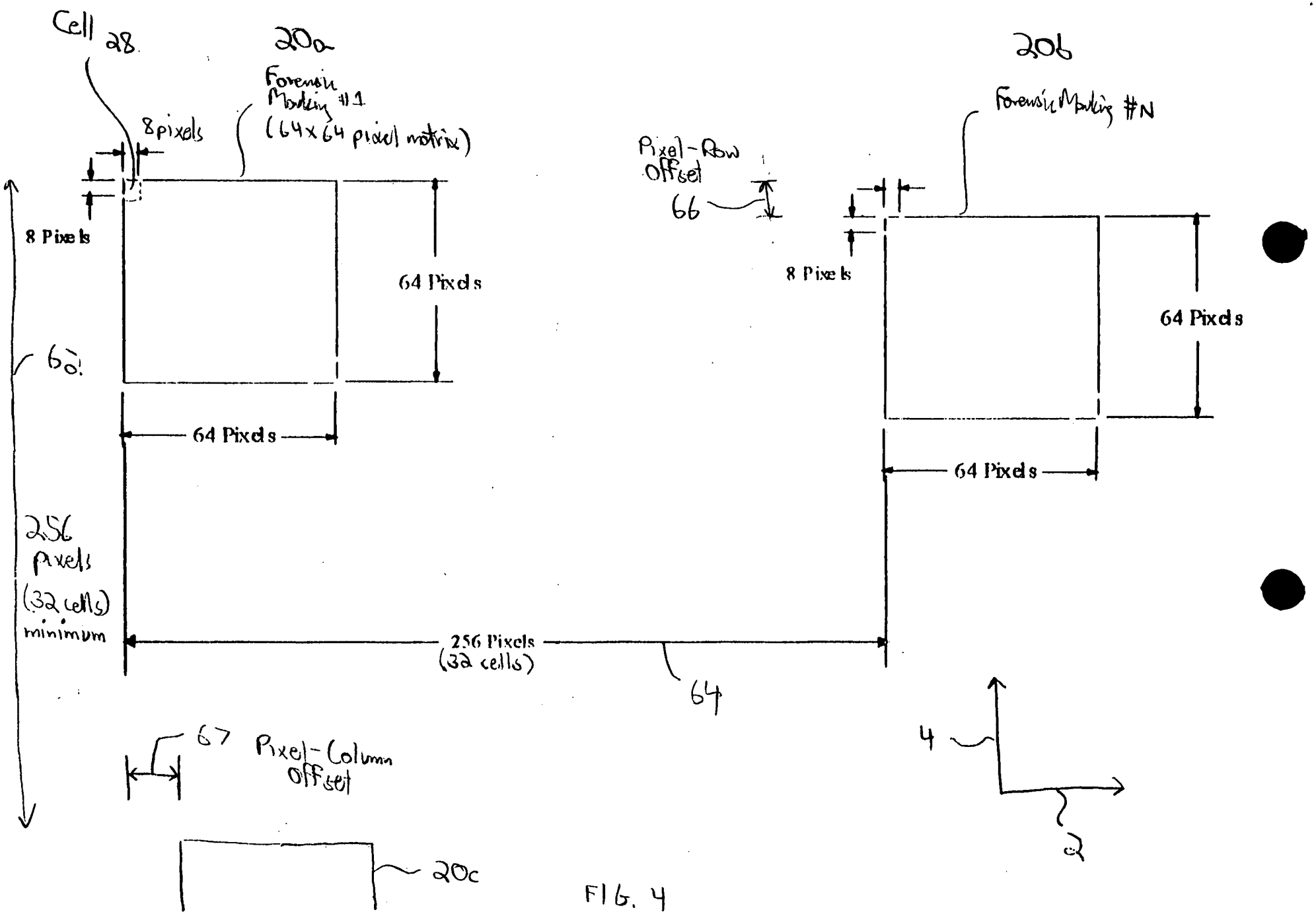

Cell 28
20a
Forensic Marking #1
(64x64 pixel matrix)
8 pixels
8 Pixels
64 Pixels
62
64 Pixels
256 pixels
(32 cells)
minimum
256 Pixels
(32 cells)
64
67 Pixel-Column offset
20c
Pixel-Row offset
66
20b
Forensic Marking #N
8 Pixels
64 Pixels
64 Pixels
4
2

FIG. 4

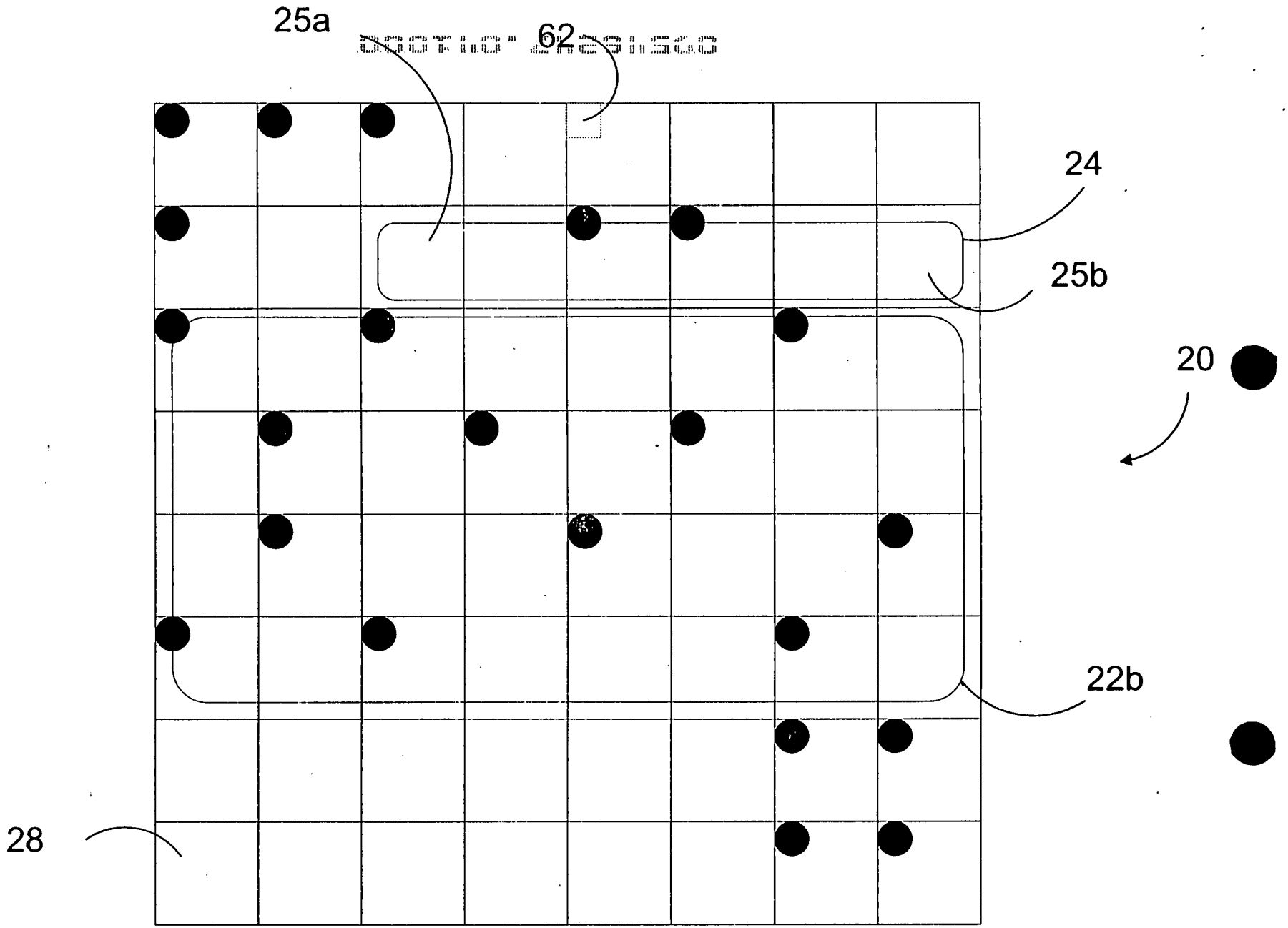


FIG. 5

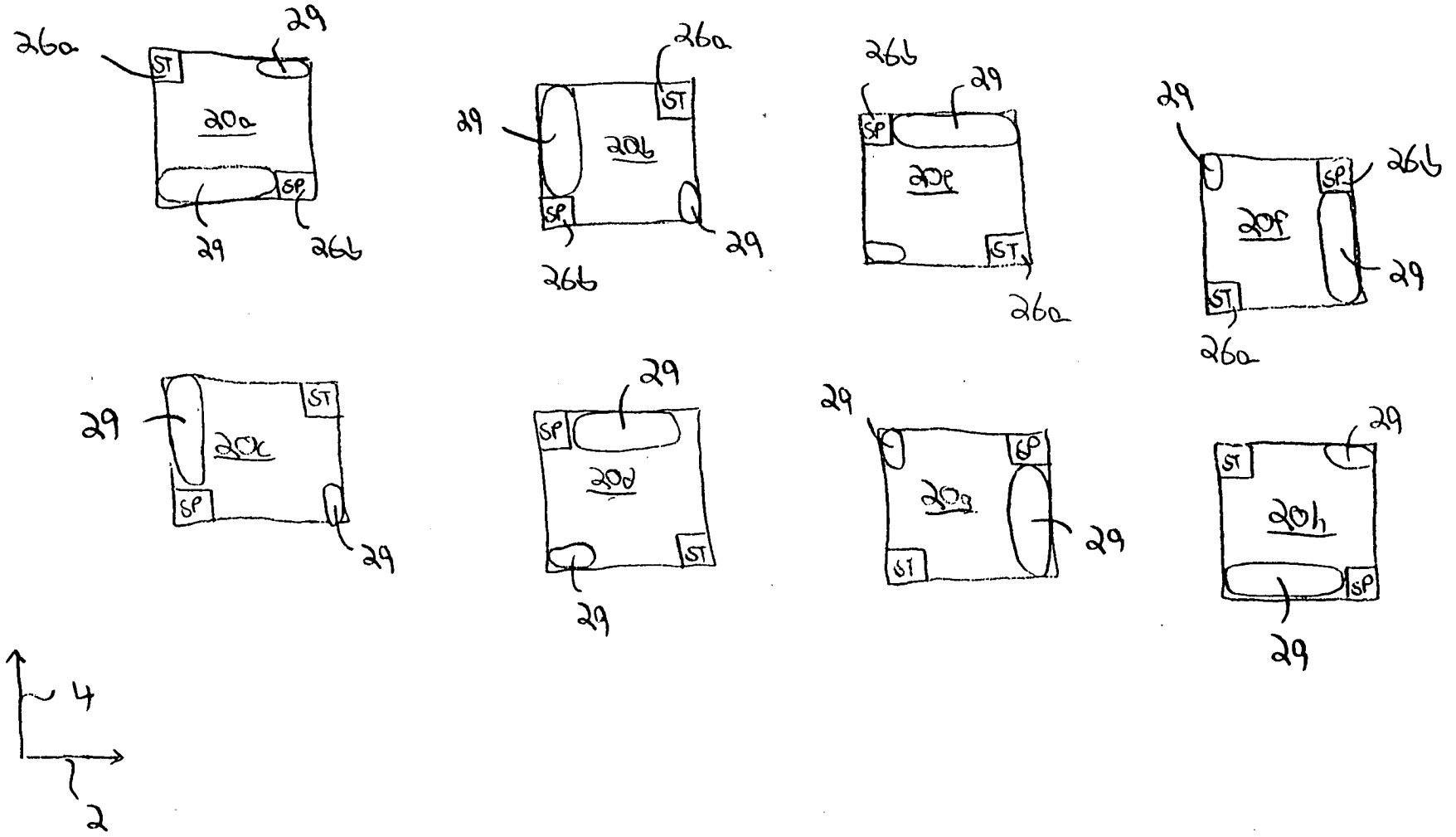
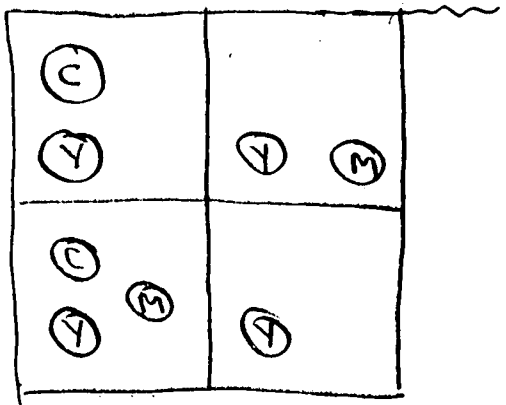

26a
29
ST
20a
SP
29
26b
26a
29
ST
20b
SP
26b
29
26b
29
SP
20e
ST
26a
29
SP
26b
20f
29
ST
26a
29
ST
20c
SP
29
29
20d
SP
ST
29
29
SP
20g
ST
29
29
ST
20h
SP
29
4
2

FIG. 6

National Brand
13-782 500 SHEETS, FILLER 5 SQUARE
42-381 50 SHEETS EYE-EASE® 5 SQUARE
42-382 100 SHEETS EYE-EASE® 5 SQUARE
42-389 200 SHEETS EYE-EASE® 5 SQUARE
42-392 100 RECYCLED WHITE 5 SQUARE
42-399 200 RECYCLED WHITE 5 SQUARE
Made in U.S.A.

Forensic marking drops not added

70c

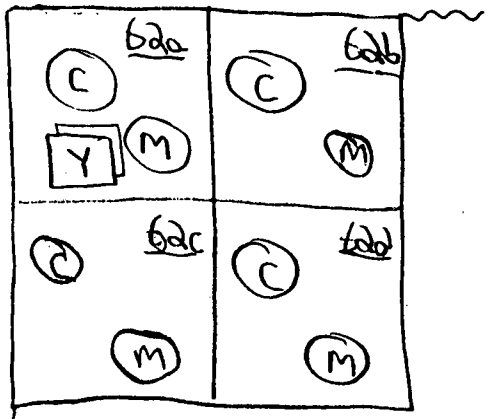


Source image has cyan, magenta, & yellow

FIG. 7C

Forensic marking drops added

70b



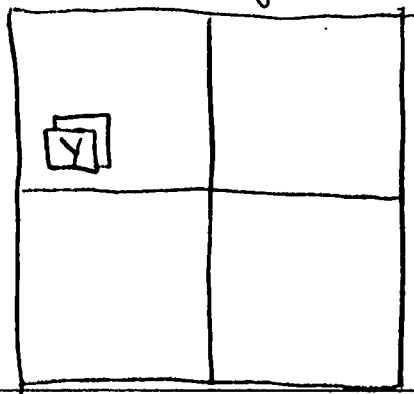
Source image has cyan & magenta

FIG. 7B

FIG. 7A

Source image blank

70a



○ = Colorant drops for source image

□ = Colorant drops for forensic marking superimposed

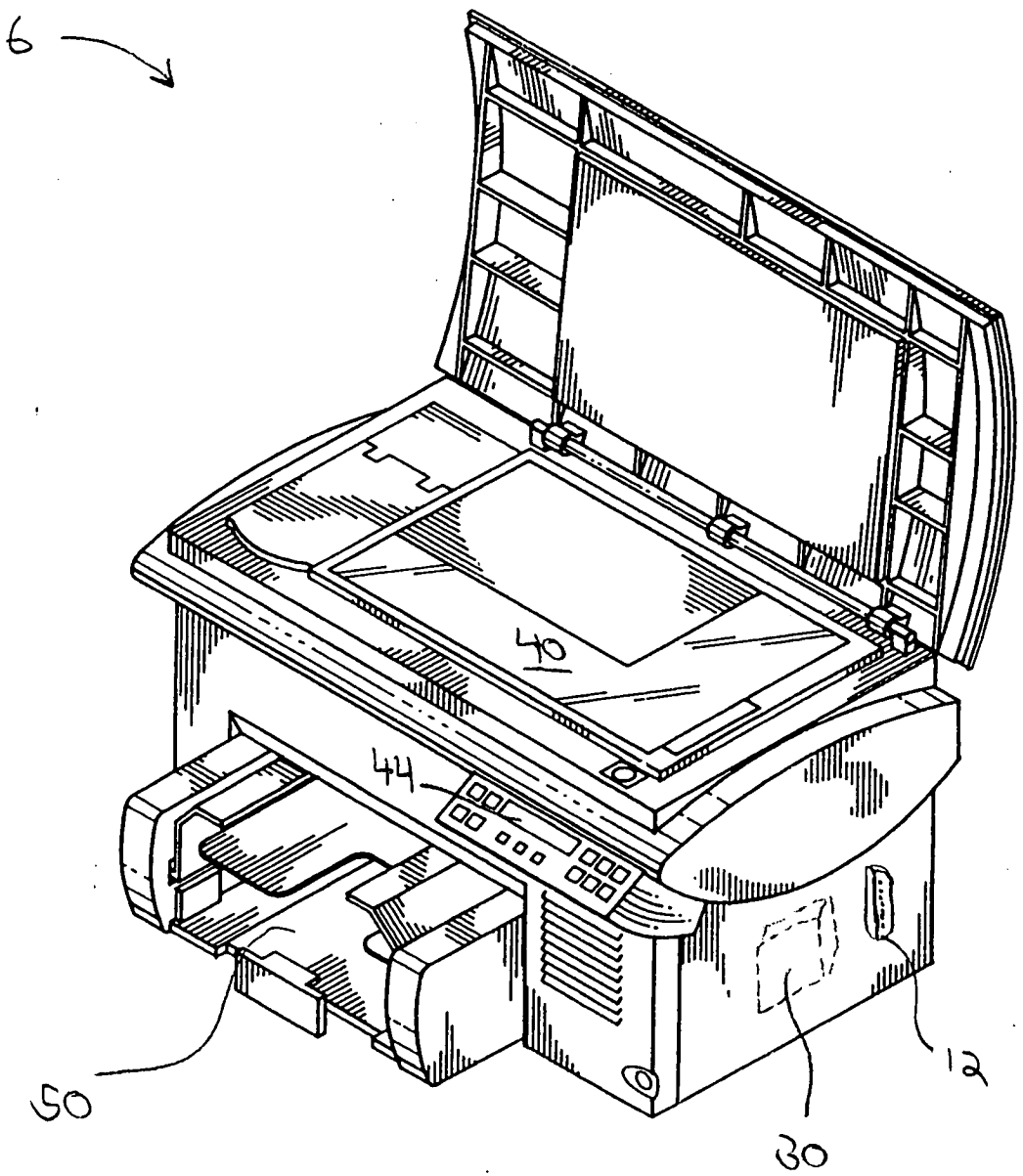


FIG. 8

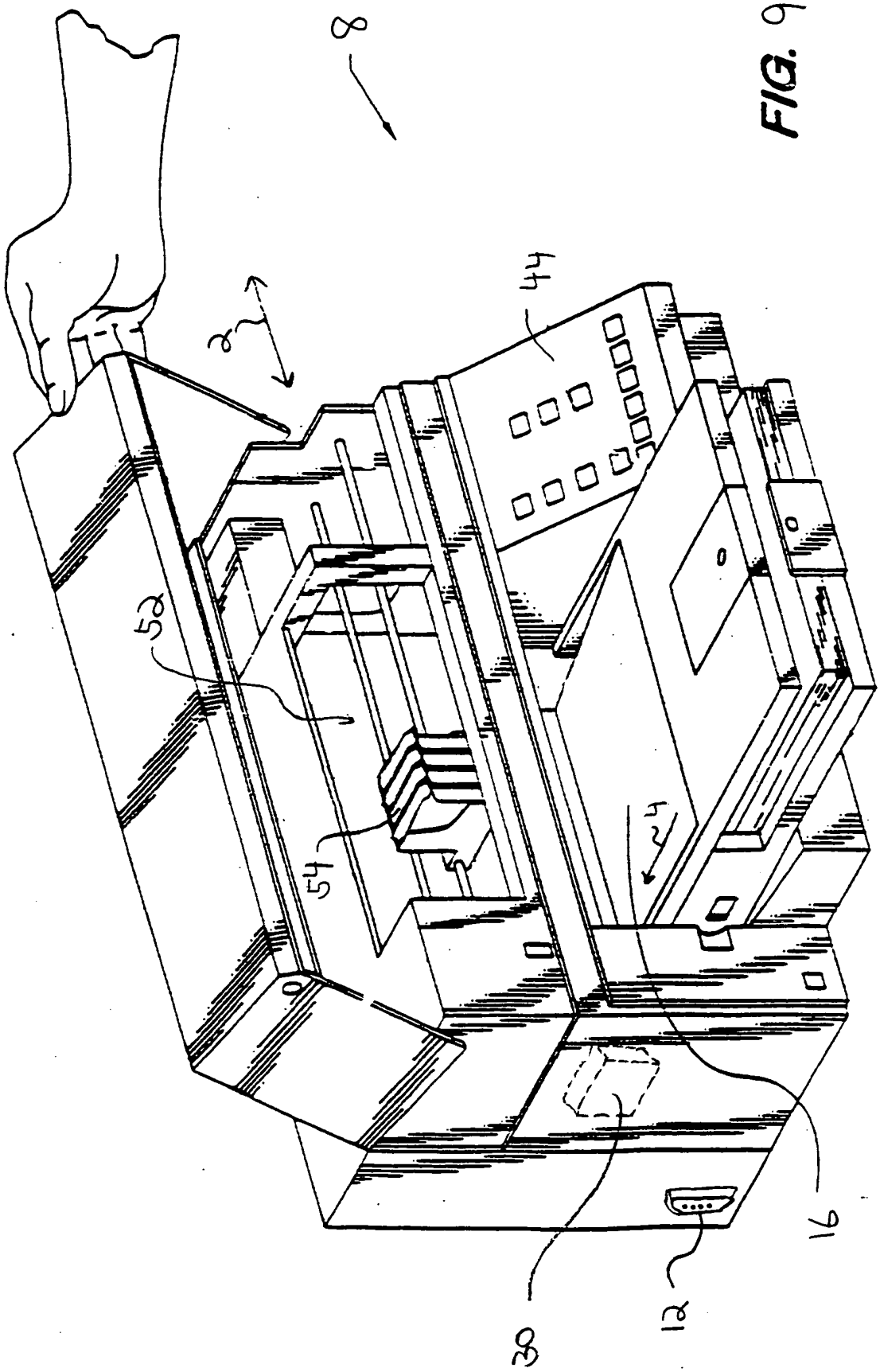


FIG. 9

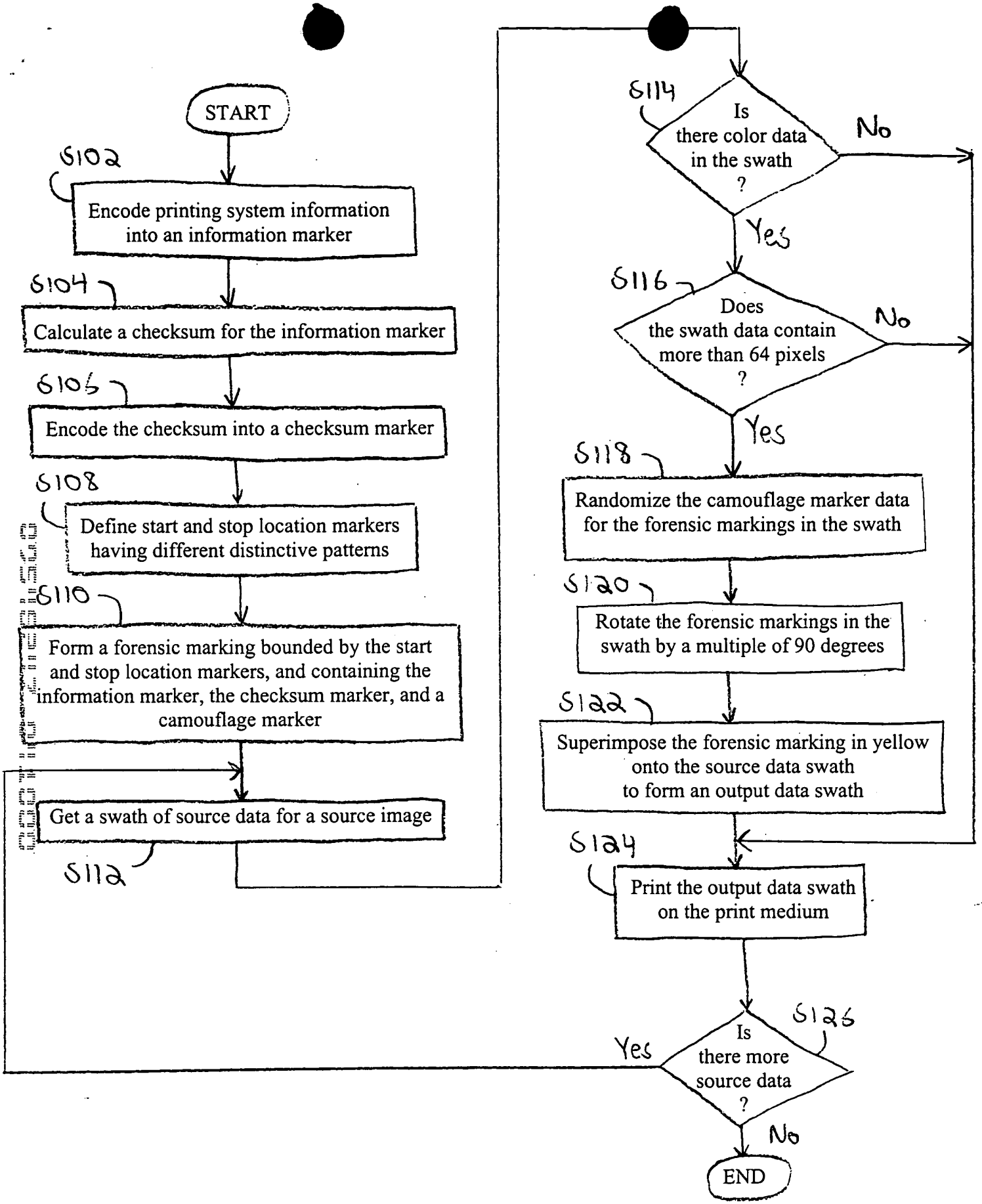

START
S102
Encode printing system information into an information marker
S104
Calculate a checksum for the information marker
S106
Encode the checksum into a checksum marker
S108
Define start and stop location markers having different distinctive patterns
S110
Form a forensic marking bounded by the start and stop location markers, and containing the information marker, the checksum marker, and a camouflage marker
Get a swath of source data for a source image
S112
S114
Is there color data in the swath ?
No
Yes
S116
Does the swath data contain more than 64 pixels ?
No
Yes
S118
Randomize the camouflage marker data for the forensic markings in the swath
S120
Rotate the forensic markings in the swath by a multiple of 90 degrees
S122
Superimpose the forensic marking in yellow onto the source data swath to form an output data swath
S124
Print the output data swath on the print medium
S126
Is there more source data ?
Yes
No
END

FIG. 10